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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/620,477	07/15/2003	Andrew Joo Kim	07982.105018	8614

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EXAMINER	
GHULAMALI, QUTBUDDIN	
ART UNIT	**PAPER NUMBER**
2637	

DATE MAILED: 09/22/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/620,477	KIM ET AL.	
	Examiner	Art Unit	
	Qutub Ghulamali	2637	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *15 July 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-32* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-32* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *7/22,5/20,2/27/04*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter, which the applicant regards as his invention.

2. Claims 5, 6, 9, 11, 15, 25, and 26, are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 5, 14 recites limitation "the input and output branches" in lines 1-2. There is insufficient antecedent basis for this limitation in the claim.

Claims 6, 15 recites the limitation "the parasitic capacitances" and "the LC design circuit" in lines 1 and 2 respectively. There is insufficient antecedent basis for these limitations in the claims.

Claim 9 recites limitation "the paths" in line 2. There is insufficient antecedent basis for this limitation in the claim.

Claim 11 recites limitation "the signal conditioning" in lines 1-2. There is insufficient antecedent basis for this limitation in the claim.

Claim 25, recites limitation "the signal integrity", "the filtered signal", "the variable gain coefficient amplifiers" in lines 1-2 respectively. There is insufficient antecedent basis for these limitations in the claim.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) The invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.
>
> (b) The invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1, 7, 8, 9, 10, 16, 17-19, 26, 27, 29-32, are rejected under 35 U.S.C. 102(e) as being anticipated by Bryant (US Pub. No: 2003/0067990).

Consider claims 1, 7, 8-10, 16, 17, 18, 26, 27, Bryant discloses (figs. 1, 3, 4a-c) a digital communication transmitting and receiving system for processing multi level digital signals (binary) comprising; a multistage equalizer 137 include several stages of finite impulse response filters (cascade) 140-147, the first stage 140 receive the output of the ADC 135 as a time sequence of digital values 308, correct (mitigate) the digital representation for linear distortion, and at least a second stage coupled to the first stage, the second stage characterized by a second function to produce from the first results second results decompressing the digital signal, an equalizer controller 157 for controlling each filter 137 in response to the value of the error measure 156, sets and changes values of parameters, and provides values to the stages of the multistage equalizer 137, employs or executes a procedure for setting (adjustable) filter parameters (empirical, experimental) in an iterative optimization process in which a data set

collected at the output of the ADC 135 (and stored at a location 170) is processed (reused) through the multistage equalizer 137 a number of times as the parameters values are optimized (adjusted, maximized) (col. 3, section 22, 24, 26).

Regarding claim 19, Bryant (fig. 1), wherein it discloses the first and the second filter stages that form part of the receive signal the corrected digital modulation signals 138 are provided to demodulation circuit 150, which extracts the carrier modulation parameters 152 are provided to symbol decision and decoding circuit 160 that compares carrier modulation parameters with allowed symbol set and selects the close matched ones, the symbol is converted back into digital data and decoded to produce output data 162 for transmitting digital signals (col. 3, section 0023).

Regarding claim 29-32, Bryant discloses optimizing the signal parameters wherein an equalizer controller 157 in response to the value of the error measure 156, sets and changes values of parameters, and provides values to the stages of the multistage equalizer 137, employs or executes a procedure for setting (adjustable) filter parameters (empirical, experimental) in an iterative optimization process in which a data set collected at the output of the ADC 135 (and stored at a location 170) is processed through the multistage equalizer 137 a number of times as the parameters values are optimized (adjusted, maximized) (col. 3, section 22, 24, 26).

5. Claims 20, 22, 25 are rejected under 35 U.S.C. 102(b) as being anticipated by Nobakht et al ("Nobakht") (US Patent No. 5,962,011).

Nobakht discloses (figs. 1(a), 1(b)), a feed forward filter (FFF) where the input is a received symbol sequence which is sent through a series of delay elements (filters) wherein each of the delayed input sequences (delay line filters) are provided with their own variable gain

amplifiers (tap gain), the variable taps referred to as adjustable coefficients (equalizing a particular frequency band of a multilevel signal (col. 7, lines 52-67; col. 8, lines 1-37).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. Claims 2, 5, 11, 14, 28, are rejected under 35 U.S.C. 103(a) as being unpatentable over Bryant (US Pub. No: 2003/0067990) in view of Nobakht et al ("Nobakht") (US Patent No. 5,962,011).

Consider claims 2, 5, 11, 14, Bryant discloses every feature of the claimed invention with above reference to claims 1, 11 and 26, but fails to disclose at least the first and second stage of the signal conditioning filter comprises a tapped delay line filter with delays distributed across the input and out of the delay line filter. Nobakht discloses a feed forward filter (FFF) where the input is a received symbol sequence which is sent through a *series of delay elements* (filters) wherein each of the delayed input sequences (delay line filters) are provided with their own variable gain amplifiers (tap gain), the variable taps referred to as adjustable coefficients (equalizing a particular frequency band of a multilevel signal (col. 7, lines 52-67; col. 8, lines 1-37). It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Bryant's system to provide a tapped delay line filter with delays distributed

across the input and out of the delay line filter so as to enhance filter performance and improve signal integrity as taught by Nobakht (col. 7, lines 52-67; col. 8, lines 5-37).

Regarding claim 28, Bryant discloses every feature of the claimed invention with above reference to claims 1, 11 and 26, Bryant however, shows no explicit disclosure regarding received signal propagating through a series of approximately same delay value. Nobakht discloses (fig. 1(a, b)) a feedback filter wherein the input is a symbol sequence which is sent through a series of delay T elements. It would have been obvious to one skilled in the art at the time the invention was made to modify Bryant to allow received signal propagate through a series of approximately same delay value so as to enhance the filtering operation as taught by Nobakht (col. 8, lines 49-56).

8. Claims 4, 6 13, 15, are rejected under 35 U.S.C. 103(a) as being unpatentable over Bryant (US Pub. No: 2003/0067990) in view of Nobakht et al ("Nobakht") (US Patent No. 5,962,011) as applied to claims 2 and 11 above, and further in view of Leuthold (US Patent 3,599,122). Bryant and Nobakht combined disclose every feature of the claimed invention. However, the tapped delay line is not explicitly disclosed to comprise LC circuit. Leuthold discloses delay network of filter that comprise of inductance L and capacitance C as circuit elements. It would have been obvious to one of ordinary skill in the art at the time the invention was made to allow the use of LC circuit with the design of Bryant and Nobakht so as to minimize noise and jitter associated with higher frequencies as taught by Leuthold (col. 1, lines 5-10, 25-48, 64-65).

9. Claim 23 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nobakht et al ("Nobakht") (US Patent No. 5,962,011) in view of Leuthold (US Patent 3,599,122).

Nobakht discloses every feature of the claimed invention with reference to claim 20 above. Nobakht however, discloses delay elements with no reference to LC circuit. Leuthold discloses delay network of filter that comprise of inductance L and capacitance C as circuit elements. It would have been obvious to one of ordinary skill in the art at the time the invention was made to allow use of LC circuits with the delay network in the design of Nobakht so as to minimize noise and jitter associated with higher frequencies as taught by Leuthold (col. 1, lines 5-10, 25-48, 64-65).

Claim 24 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nobakht et al ("Nobakht") (US Patent No. 5,962,011) in view of Bryant (US Pub. No: 2003/0067990).

Nobakht discloses every feature of the claimed invention with reference to claim 20 above. Nobakht, however, does not disclose a signal unit for controlling each filter. Bryant discloses (fig. 1), an equalizer controller 157, control each filter 137 of the multistage equalizer 137 (col. 3, section 26). It would have been obvious to one of ordinary skill in the art at the time the invention was made to include a control unit for controlling each filter with the design of Nobakht so as to provide better control of the filters for a cumulative filter distribution as taught by Bryant (col. 3, section 26).

10. Claims 3, 12, are rejected under 35 U.S.C. 103(a) as being unpatentable over Bryant (US Pub. No: 2003/0067990) in view of Nobakht et al ("Nobakht") (US Patent No. 5,962,011) as applied to claims 2 and 11 above, and further in view of P. Weger et al ("Weger"), ("Gilbert Multiplier as an active mixer with conversion gain bandwidth of up to 17 GHz", Electronics Letters, 28 March 1991, Vol. 27, Issue 7).

Bryant and Nobakht in combination with other claim limitation disclose every feature of the invention with claims 2, 11 above, but fail to teach filter coefficient amplifier comprising a Gilbert cell multiplier. Weger discloses Page 570 (fig. 1) a Gilgert cell multiplier as amplifier with emitter followers. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include Gilbert cell multiplier circuit as an effective 4-quadrant multiplier with the design of Bryant and Nobakht, so as to allow the gain coefficient to be negative or positive and provide better filter equalization as taught by Weger.

11. Claim 21, is rejected under 35 U.S.C. 103(a) as being unpatentable over Nobakht et al ("Nobakht") (US Patent No. 5,962,011) in view of P. Weger et al ("Weger"), ("Gilbert Multiplier as an active mixer with conversion gain bandwidth of up to 17 GHz", Electronics Letters, 28 March 1991, Vol. 27, Issue 7).

Nobakht in combination with other claim limitations discloses every feature of the invention with reference to claim 20 above, but fail to teach filter coefficient amplifier comprising a Gilbert cell multiplier. Weger discloses Page 570 (fig. 1) a Gilgert cell multiplier as amplifier with emitter followers. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include Gilbert cell multiplier circuit as an effective 4-quadrant multiplier with the design of Nobakht, so as to allow the gain coefficient to be negative or positive and provide better filter equalization as taught by Weger.

Conclusion

12. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Feher (US Patent 6,665,348), Tamburelli (US Patent 4,288,872), Ohta et al (US Pub. No. 2003/0058976) are cited as arts of interest showing adaptive filtering and equalization.

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Qutub Ghulamali whose telephone number is (571) 272-3014. The examiner can normally be reached on Monday-Friday from 8:00AM - 5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jay Patel can be reached on (571) 272-2988. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Qutub Ghulamali
September 3, 2004.

TEMESGHEN GHEBRETINSAE
PRIMARY EXAMINER
9/20/04